



| charge in cfs | | | Total Recoverable Aluminum Coefficients | | |
|-----------------------|---------|-------------------------|---|-------|------------|
| Intercept coefficient | | | B Intercept | | |
| Runoff | | Low Flow November-March | A72 | 1.000 | 496.92654 |
| M34 | -2.771 | 0.394 | M34 | 0.080 | 299.49322 |
| CC48 | 1.752 | 0.130 | CC48 | 1.000 | 2153.80184 |
| A68 | -11.131 | 0.498 | A68 | 0.001 | 140.21455 |

Discharge Relationships among the three gages

| MONTH | J | F | M | A | M | J | J |
|--------------|----|----|----|-----|-----|------|-----|
| Intercept | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| A 72 | 64 | 63 | 77 | 155 | 682 | 1196 | 624 |
| M34 | 22 | 22 | 28 | 58 | 266 | 468 | 243 |
| CC48 | 14 | 13 | 15 | 22 | 91 | 158 | 83 |
| A68 | 25 | 25 | 31 | 66 | 329 | 585 | 300 |
| Ground water | 3 | 3 | 3 | 9 | -3 | -14 | -2 |

1/(1+BQ) Discharge Representation

| | | | | | | | |
|------|--------|--------|--------|--------|--------|--------|--------|
| A 72 | 0.0154 | 0.0156 | 0.0128 | 0.0064 | 0.0015 | 0.0008 | 0.0016 |
| M34 | 0.3572 | 0.3612 | 0.3123 | 0.1767 | 0.0449 | 0.0260 | 0.0489 |
| CC48 | 0.0689 | 0.0694 | 0.0629 | 0.0435 | 0.0109 | 0.0063 | 0.0119 |
| A68 | 0.9754 | 0.9758 | 0.9698 | 0.9380 | 0.7527 | 0.6311 | 0.7694 |

Date variables

| | | | | | | | |
|---------|--------|--------|---------|---------|---------|---------|---------|
| sin | 0.1552 | 0.6358 | 0.9276 | 0.9887 | 0.7862 | 0.3629 | -0.1441 |
| cos | 0.9879 | 0.7719 | 0.3737 | -0.1496 | -0.6180 | -0.9318 | -0.9896 |
| sin1 | 0.3066 | 0.9815 | 0.6932 | -0.2959 | -0.9717 | -0.6763 | 0.2852 |
| cos1 | 0.9518 | 0.1916 | -0.7207 | -0.9552 | -0.2361 | 0.7366 | 0.9585 |
| Consent | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

| | | | | | | | | |
|-----|-----------|--------|--------|---------|---------|---------|---------|---------|
| A72 | Intercept | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | BQ | 0.0154 | 0.0156 | 0.0128 | 0.0064 | 0.0015 | 0.0008 | 0.0016 |
| | sin | 0.1552 | 0.6358 | 0.9276 | 0.9887 | 0.7862 | 0.3629 | -0.1441 |
| | cos | 0.9879 | 0.7719 | 0.3737 | -0.1496 | -0.6180 | -0.9318 | -0.9896 |
| | sin1 | 0.3066 | 0.9815 | 0.6932 | -0.2959 | -0.9717 | -0.6763 | 0.2852 |
| | cos1 | 0.9518 | 0.1916 | -0.7207 | -0.9552 | -0.2361 | 0.7366 | 0.9585 |
| | Consent | | | | | | | |

| | | | | | | | |
|--------------------------|-------------|-------------|-------------|-------------|------------|------------|------------|
| A72 Concentration | 2916 | 3055 | 2672 | 1683 | 839 | 580 | 537 |
|--------------------------|-------------|-------------|-------------|-------------|------------|------------|------------|

| M34 | | Intercept | 1 | 1 | 1 | 1 | 1 | 1 |
|---------|--|-----------|--------|--------|---------|---------|---------|---------|
| BQ | | | 0.3572 | 0.3612 | 0.3123 | 0.1767 | 0.0449 | 0.0260 |
| sin | | | 0.1552 | 0.6358 | 0.9276 | 0.9887 | 0.7862 | 0.3629 |
| cos | | | 0.9879 | 0.7719 | 0.3737 | -0.1496 | -0.6180 | -0.9318 |
| sin1 | | | 0.3066 | 0.9815 | 0.6932 | -0.2959 | -0.9717 | -0.6763 |
| cos1 | | | 0.9518 | 0.1916 | -0.7207 | -0.9552 | -0.2361 | 0.7366 |
| Consent | | | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |

| | | | | | | | |
|-------------------|------|------|------|------|-----|-----|-----|
| M34 Concentration | 4331 | 4376 | 3824 | 2293 | 806 | 593 | 852 |
|-------------------|------|------|------|------|-----|-----|-----|

| | | | | | | | | |
|--------------------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CC 48 | Intercept | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | BQ | 0.0689 | 0.0694 | 0.0629 | 0.0435 | 0.0109 | 0.0063 | 0.0119 |
| | sin | 0.1552 | 0.6358 | 0.9276 | 0.9887 | 0.7862 | 0.3629 | -0.1441 |
| | cos | 0.9879 | 0.7719 | 0.3737 | -0.1496 | -0.6180 | -0.9318 | -0.9896 |
| | sin1 | 0.3066 | 0.9815 | 0.6932 | -0.2959 | -0.9717 | -0.6763 | 0.2852 |
| | cos1 | 0.9518 | 0.1916 | -0.7207 | -0.9552 | -0.2361 | 0.7366 | 0.9585 |
| | Consent | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| CC 48 Concentration | | 6027 | 6101 | 5696 | 4528 | 2655 | 2164 | 2262 |
| A68 | Intercept | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | BQ | 0.9754 | 0.9758 | 0.9698 | 0.9380 | 0.7527 | 0.6311 | 0.7694 |
| | sin | 0.1552 | 0.6358 | 0.9276 | 0.9887 | 0.7862 | 0.3629 | -0.1441 |
| | cos | 0.9879 | 0.7719 | 0.3737 | -0.1496 | -0.6180 | -0.9318 | -0.9896 |
| | sin1 | 0.3066 | 0.9815 | 0.6932 | -0.2959 | -0.9717 | -0.6763 | 0.2852 |
| | cos1 | 0.9518 | 0.1916 | -0.7207 | -0.9552 | -0.2361 | 0.7366 | 0.9585 |
| | Consent | | | | | | | |
| A68 Concentration | | 166 | 204 | 228 | 232 | 213 | 176 | 136 |
| Concentration | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Load in pounds per day | | | | | | | | |
| | Sum | 988 | 992 | 1064 | 1341 | 2834 | 3898 | 2354 |
| | A72 | 1008 | 1039 | 1111 | 1409 | 3090 | 3745 | 1810 |
| | % Difference | -0.02 | -0.05 | -0.04 | -0.05 | -0.08 | 0.04 | 0.30 |
| | RPD | -0.02 | -0.05 | -0.04 | -0.05 | -0.09 | 0.04 | 0.26 |

Recoverable Aluminum Coefficients

| BQ | sin | cos |
|-------------------|-----------|------------------|
| 44614.59702 | 285.00575 | <u>151.57158</u> |
| <u>1284.63217</u> | | |
| 49268.69456 | 298.24193 | <u>438.56568</u> |
| 11.83749 | 81.56609 | <u>1.12097</u> |

| A | S | O | N | D |
|-----|-----|-----|----|----|
| 1 | 1 | 1 | 1 | 1 |
| 268 | 187 | 142 | 92 | 70 |
| 103 | 71 | 53 | 33 | 25 |
| 37 | 26 | 20 | 16 | 14 |
| 122 | 82 | 60 | 38 | 28 |
| 6 | 8 | 9 | 4 | 3 |

| | | | | |
|--------|--------|--------|--------|--------|
| 0.0037 | 0.0053 | 0.0070 | 0.0108 | 0.0141 |
| 0.1085 | 0.1500 | 0.1904 | 0.2727 | 0.3350 |
| 0.0265 | 0.0368 | 0.0470 | 0.0572 | 0.0660 |
| 0.8910 | 0.9242 | 0.9438 | 0.9635 | 0.9728 |

| | | | | |
|---------|---------|---------|---------|---------|
| -0.6271 | -0.9360 | -0.9878 | -0.7716 | -0.3573 |
| -0.7789 | -0.3521 | 0.1556 | 0.6361 | 0.9340 |
| 0.9769 | 0.6591 | -0.3074 | -0.9816 | -0.6674 |
| 0.2135 | -0.7521 | -0.9516 | -0.1908 | 0.7447 |
| 1 | 1 | 1 | 1 | 1 |

| | | | | |
|---------|---------|---------|---------|---------|
| 1 | 1 | 1 | 1 | 1 |
| 0.0037 | 0.0053 | 0.0070 | 0.0108 | 0.0141 |
| -0.6271 | -0.9360 | -0.9878 | -0.7716 | -0.3573 |
| -0.7789 | -0.3521 | 0.1556 | 0.6361 | 0.9340 |
| 0.9769 | 0.6591 | -0.3074 | -0.9816 | -0.6674 |
| 0.2135 | -0.7521 | -0.9516 | -0.1908 | 0.7447 |

| | | | | |
|------------|------------|-------------|-------------|-------------|
| 738 | 946 | 1250 | 1928 | 2573 |
|------------|------------|-------------|-------------|-------------|

| | | | | |
|-------------|-------------|-------------|-------------|-------------|
| 1 | 1 | 1 | 1 | 1 |
| 0.1085 | 0.1500 | 0.1904 | 0.2727 | 0.3350 |
| -0.6271 | -0.9360 | -0.9878 | -0.7716 | -0.3573 |
| -0.7789 | -0.3521 | 0.1556 | 0.6361 | 0.9340 |
| 0.9769 | 0.6591 | -0.3074 | -0.9816 | -0.6674 |
| 0.2135 | -0.7521 | -0.9516 | -0.1908 | 0.7447 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1523 | 1992 | 2449 | 3377 | 4080 |

| | | | | |
|-------------|-------------|-------------|-------------|-------------|
| 1 | 1 | 1 | 1 | 1 |
| 0.0265 | 0.0368 | 0.0470 | 0.0572 | 0.0660 |
| -0.6271 | -0.9360 | -0.9878 | -0.7716 | -0.3573 |
| -0.7789 | -0.3521 | 0.1556 | 0.6361 | 0.9340 |
| 0.9769 | 0.6591 | -0.3074 | -0.9816 | -0.6674 |
| 0.2135 | -0.7521 | -0.9516 | -0.1908 | 0.7447 |
| 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 2932 | 3536 | 4244 | 5023 | 5709 |

| | | | | |
|-----------|-----------|-----------|-----------|------------|
| 1 | 1 | 1 | 1 | 1 |
| 0.8910 | 0.9242 | 0.9438 | 0.9635 | 0.9728 |
| -0.6271 | -0.9360 | -0.9878 | -0.7716 | -0.3573 |
| -0.7789 | -0.3521 | 0.1556 | 0.6361 | 0.9340 |
| 0.9769 | 0.6591 | -0.3074 | -0.9816 | -0.6674 |
| 0.2135 | -0.7521 | -0.9516 | -0.1908 | 0.7447 |
| 99 | 74 | 71 | 89 | 124 |

| | | | | |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 |
|---|---|---|---|---|

| | | | | |
|------|------|------|------|------|
| 1492 | 1294 | 1190 | 1073 | 1002 |
| 1068 | 955 | 959 | 958 | 973 |
| 0.40 | 0.35 | 0.24 | 0.12 | 0.03 |
| 0.33 | 0.30 | 0.22 | 0.11 | 0.03 |

| A72 | | | Prediction Equation Coefficients | |
|--------------------|--------|--------|----------------------------------|---------|
| Chronic TVS at A72 | | | Hardness | |
| | a2 | b2 | | |
| Cd | -3.49 | 0.7852 | B | 0.006 |
| Cu | -1.485 | 0.8545 | Intercept | 82.304 |
| Mn | 4.785 | 0.5434 | BQ | 200.676 |
| Zn | 0.7614 | 0.8473 | sin | 16.936 |
| | | | cos | 48.860 |
| | | | sin1 | 15.385 |
| | | | cos1 | -5.633 |

| Month | J | F | M | A | M | J | J |
|----------|------|------|------|------|------|------|------|
| Q | 64 | 63 | 77 | 155 | 682 | 1196 | 624 |
| Hardness | 277 | 290 | 268 | 196 | 91 | 53 | 72 |
| Al ch | 87 | 87 | 87 | 87 | 87 | 87 | 87 |
| Cd ch | 2.5 | 2.6 | 2.5 | 1.9 | 1.1 | 0.7 | 0.9 |
| Cu ch | 14 | 14 | 13 | 10 | 5 | 3 | 4 |
| Mn ch | 2544 | 2607 | 2497 | 2107 | 1388 | 1032 | 1227 |
| Zn ch | 251 | 261 | 244 | 187 | 98 | 62 | 81 |

| M 34 | | Prediction equation coefficients | | | | | |
|--------------|--|----------------------------------|----------|-----------|-----------|-----------|-----------|
| | | Hardness | Aluminum | Cadmium | Copper | Iron | Zinc |
| B | | 0.013 | 1.00 | 0.021 | 0.123 | 0.06521 | 0.021 |
| Intercept | | 60.05228 | 15.10361 | 0.91724 | 14.65129 | 77.70523 | 105.25873 |
| BQ | | 105.02801 | 38.29032 | 0.60966 | 0.98354 | 70.29706 | 78.11589 |
| sin | | 9.24827 | 69.03843 | 0.26911 | 14.16661 | 89.38888 | 88.77920 |
| cos | | 32.30173 | 79.08681 | 0.20991 | 10.17487 | 38.04002 | 85.94018 |
| sin1 | | 435.43127 | -0.12214 | 1.04278 | 86.24646 | -17.99615 | |
| cos1 | | 123.10453 | -0.14689 | -3.82920 | -12.30367 | -45.60154 | |
| consent | | -265.10754 | | -10.75402 | 35.80515 | -98.00378 | |
| MONTH | | J | F | M | A | M | J |
| Avg monthly | | 22 | 22 | 28 | 58 | 266 | 468 |
| Hardness | | 255 | 241 | 226 | 170 | 86 | 60 |
| Chronic Stan | | 87 | 87 | 87 | 87 | 87 | 87 |
| Al, ch | | 2.4 | 2.3 | 2.1 | 1.7 | 1.0 | 0.8 |
| Cd, ch | | 26 | 25 | 23 | 18 | 10 | 7 |
| Cu ch | | | | | | | 9 |

| | | | | | | | |
|-------|------|------|------|------|------|------|------|
| Mn | 2430 | 2359 | 2275 | 1951 | 1351 | 1105 | 1257 |
| Zn ch | 234 | 224 | 211 | 166 | 94 | 68 | 84 |

A68 Animas at Silverton

| | | Prediction equation coefficients | | | | | |
|-------------|----------|----------------------------------|---------|--------|-----------|----------|------|
| | | Hardness | Cadmium | Copper | Manganese | Zinc | |
| B | | 0.011na | na | 0.010 | 0.016 | | |
| Intercept | | 37.945 | 2.395 | 5.783 | 258.473 | 304.617 | |
| BQ | | 165.600 | | | 1371.923 | 644.136 | |
| sin | | | 1.712 | 2.049 | 611.024 | 315.451 | |
| cos | | | 0.140 | 0.729 | 81.662 | -18.603 | |
| sin1 | | | -0.250 | -1.520 | 16.031 | -33.783 | |
| cos1 | | | -1.185 | -0.472 | -263.628 | -140.108 | |
| May | | | -1.936 | 2.261 | -258.699 | | |
| consent | | | -0.714 | -1.828 | 411.428 | -67.174 | |
| Animas R | Month | J | F | M | A | M | J |
| | Q | 25 | 25 | 31 | 66 | 329 | 585 |
| | Hardness | 168 | 168 | 161 | 134 | 74 | 60 |
| | Cd, tvs | 1.7 | 1.7 | 1.7 | 1.4 | 0.9 | 0.8 |
| | Cu tvs | 18 | 18 | 17 | 15 | 9 | 8 |
| | Mn tvs | 1935 | 1938 | 1895 | 1713 | 1240 | 1110 |
| ponic stand | Al | 87 | 87 | 87 | 87 | 87 | 87 |

ction Equation Coefficients

| A | S | O | N | D |
|------|------|------|------|------|
| 268 | 187 | 142 | 92 | 70 |
| 124 | 158 | 182 | 215 | 248 |
| 87 | 87 | 87 | 87 | 87 |
| 1.3 | 1.6 | 1.8 | 2.1 | 2.3 |
| 7 | 9 | 10 | 11 | 13 |
| 1643 | 1872 | 2022 | 2217 | 2396 |
| 127 | 156 | 176 | 203 | 229 |

| | Acute TVS at M34 | | Chronic TVS at M34 | |
|----|------------------|--------|--------------------|--------|
| | a2 | b2 | a3 | b3 |
| Cd | -3.828 | 1.128 | -3.49 | 0.7852 |
| Cu | -0.7703 | 0.9422 | -1.485 | 0.8545 |
| Mn | 4.4995 | 0.7893 | 4.785 | 0.5434 |
| Zn | 0.8904 | 0.8473 | 0.7614 | 0.8473 |

| A | S | O | N | D |
|-----|-----|-----|-----|-----|
| 103 | 71 | 53 | 33 | 25 |
| 126 | 151 | 192 | 217 | 253 |
| 87 | 87 | 87 | 87 | 87 |
| 1.4 | 1.6 | 1.9 | 2.1 | 2.3 |
| 14 | 16 | 20 | 22 | 26 |

| | | | | |
|------|------|------|------|------|
| 1659 | 1829 | 2085 | 2229 | 2418 |
| 129 | 150 | 184 | 205 | 232 |

| Chronic TVS at A68 | | |
|--------------------|--------|--------|
| | a2 | b2 |
| Cd | -3.49 | 0.7852 |
| Cu | -1.485 | 0.8545 |
| Mn | 4.785 | 0.5434 |
| Zn | 0.7614 | 0.8473 |

| A | S | O | N | D |
|------|------|------|------|------|
| 122 | 82 | 60 | 38 | 28 |
| 109 | 125 | 138 | 155 | 165 |
| 1.2 | 1.4 | 1.5 | 1.6 | 1.7 |
| 12 | 14 | 15 | 17 | 18 |
| 1528 | 1650 | 1741 | 1854 | 1916 |
| 87 | 87 | 87 | 87 | 87 |